THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATION COUNCIL OF TANZANIA

FORM TWO NATIONAL ASSESSMENT

072 **ARCHITECTURAL DAUGHTING**

Time: 2:30 Hours. **ANSWER** **Year: 2022**

Instructions

1. This paper consists of sections **A**, **B** and **C** with a total of **ten (10)** questions.
2. Answer **all** questions.
3. Section A carries **15** marks; section B carries **45** marks and section C carries 40 marks.
4. All writing must be in **black** or **blue** ink and drawings must be in **pencil**.
5. Cellular phones and unauthorized materials are **not allowed** in the examination room.
6. Write your **Assessment Number** at the top-right hand corner of every page.

FOR EXAMINER'S USE ONLY		
QUESTION NUMBER	**SCORE**	**EXAMINER'S INITIIALS**
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
TOTAL		
CHECKER'S INITIALS		

SECTION A (15 MARKS)

Answer all questions in this section

1. Choose the correct answer from among the four (4) alternatives (A – D) and write its letter in the box provided.

(i) Which type of auxiliary view is projected onto a plane that is perpendicular to one of the principal planes of projection?

A. Secondary

B. Primary

C. Successive

D. Revolved

B. Primary.

A primary auxiliary view is obtained by projecting an object onto an auxiliary plane that is perpendicular to one of the principal planes. This type of auxiliary view is used first to show the true shape of an inclined surface that cannot be seen clearly in the principal views.

(ii) You are given the following grades of pencil lead: 3B, 4B, 5B and 6B. Which of these grades has the softest lead?

A. 3B

B. 4B

C. 5B

D. 6B

D. 6B.

The softness of pencil leads increases as the number before the letter B increases. Therefore, among 3B, 4B, 5B and 6B, the 6B pencil has the softest lead and produces the darkest lines.

(iii) Suppose you are preparing a drawing of an object with curves which have no constant radii. Which piece of the drafting equipment will you use?

A. Fench curve

B. Dividers

C. Compass

D. Template.

A. Fench curve.

A French curve is specifically designed to draw smooth irregular curves that do not have a constant radius. A compass is limited to circular arcs with fixed radii, while dividers and templates cannot accurately produce free flowing curves.

(iv) Suppose a draftsman is preparing a drawing of a residential building on A3 sheet. Which of the following is not included in the title block?

A. Method of projection

B. Size of the sheet

C. Scale

D. Sheet number.

B. Size of the sheet.

The title block normally contains information such as the method of projection, scale, sheet number, drawing title, and name of the drafter. The size of the sheet is already defined by the paper used and is not usually written in the title block.

(v) A pavement block is required to be made from a regular polygon with parallel face. How many pairs of parallel faces a pavement block will have if a regular hexagon is chosen?

A. 1

B. 2

C. 3

D. 6

C. 3.

A regular hexagon has six sides arranged in such a way that each side has an opposite side parallel to it. This results in three distinct pairs of parallel sides.

(vi) You are required to prepare a drawing of a cylindrical water tank. How will you present hidden outline in a drawing?

A. By chain thick

B. By dashed thick

C. By continuous thin

D. By chain thin double dashed

D. By chain thin double dashed.

Hidden outlines are represented by thin chain lines with double dashes according to standard technical drawing conventions. This distinguishes hidden features from visible outlines and center lines.

(vii) Which projection is used to see the surrounding environment and the building?

A. Perspective

B. Isometric

C. Oblique

D. Auxiliary.

A. Perspective.

Perspective projection represents objects as they appear to the human eye, including depth and surroundings. It is commonly used to show buildings together with their environment in a realistic manner.

(viii) Which system of placing dimensions will you use when drawing the floor plan of a shop building with doors and windows?

A. Break and aligned

B. Aligned and directional

C. Break and unidirectional

D. Unidirectional and directional

C. Break and unidirectional.

In architectural drawings such as floor plans, the unidirectional system is preferred because all dimensions are read from the bottom of the drawing. Breaks are also used to avoid overcrowding where doors and windows are closely spaced.

(ix) Identify two main classifications of drawing.

A. Pictorial and orthographic

B. Artist and geometrical

C. Artist and technical

D. Technical and engineering.

A. Pictorial and orthographic.

Technical drawing is broadly classified into pictorial drawings, which show objects in three dimensions, and orthographic drawings, which represent objects using multiple views to show exact shape and size.

(x) Suppose you are required to use pictorial drawing to present ideas to the client. Which drawings is appropriate to use?

A. Auxiliary view

B. Isometric

C. Oblique

D. Perspective.

D. Perspective.

Perspective drawings are most suitable for presenting ideas to clients because they look realistic and closely resemble how the object will appear in real life.

2. Match the responsibilities given in List A with their corresponding technical titles in List B by writing a letter of the correct responses in the table provided.

LIST A

i) Uniformity in width of all strokes is the main distinguishing characteristics.

ii) Difficult to read and draw.

iii) Can be used in both gothic as well as roman.

iv) Thick and thin width strokes and serifs are the main distinguishing features.

v) Interconnected lower case letters are used within the words.

LIST B

A. Roman

B. Vertical

C. Gothic

D. Script

E. Italics

F. Texts

G. Serifs

H. Inclined

List A (i) (ii) (iii) (iv) (v)

List B C, E, H, A, D

SECTION B (45 MARKS)

Answer all questions from this section

3. (a) With the aid of drawing, to describe two common methods applied in drawing the pictorial projection of cylindrical objects.

(i) Isometric method.

In the isometric method, the cylindrical object is drawn with its circular faces represented as ellipses. The axes are drawn at 120 degrees to each other, and the height is measured along the vertical axis. This method gives a clear three dimensional appearance with equal scale along all axes.

(ii) Oblique method.

In the oblique method, the front face of the cylinder is drawn as a true circle, while the depth is drawn at an angle, commonly 45 degrees. The receding lines are shortened to reduce distortion, making the drawing simple and quick to construct.

(b) Draw, to a scale of 1:50, a third angle projection of the tank in the figure provided.

In third angle projection, the front view of the tank is drawn first, followed by the top view placed above the front view and the right side view placed to the right of the front view. All dimensions of the tank are reduced according to the scale of 1:50, meaning 1 unit on the drawing represents 50 units on the actual tank.

4. The process of drawing objects like chairs, tables or buildings on a piece of paper is only possible when a scale is used:

(a) With examples, to explain three types of scales used in architectural draughting.

(i) Full scale.

A full scale is represented as 1:1, where the drawing is the same size as the actual

object. For example, a door handle detail can be drawn full size to show accurate shape and dimensions.

(ii) Reduced scale.
A reduced scale is used when the object is too large to fit on the drawing sheet. For example, a classroom plan may be drawn at 1:100, meaning 1mm on the drawing represents 100mm on the actual building.

(iii) Enlarged scale.
An enlarged scale is used for small components that need clarity. For example, a window joint detail can be drawn at 2:1 to show construction details clearly.

(b) Consider a rectangle that represent actual size of the floor plan of a certain classroom sized 20,000mm x 30,000mm

(iv) Determine the sizes of the rectangle drawn on paper using the scale of 1:100.

At a scale of 1:100, each actual dimension is divided by 100.
20,000mm ÷ 100 = 200mm
30,000mm ÷ 100 = 300mm
Therefore, the rectangle drawn on paper will measure 200mm by 300mm.

(v) To a scale of 1:100, draw and dimension the rectangle with size calculated in b(iv).

A rectangle of length 300mm and width 200mm is drawn. Dimension lines are added outside the rectangle, clearly indicating 300mm on the longer side and 200mm on the shorter side, using unidirectional dimensioning.

5. (a) With help of a drawing, enumerate four procedures you will follow in drawing hexagon inscribed in a circle of any given diameter.

(i) Draw a circle of the given diameter using a compass.
The circle represents the circumcircle in which the hexagon will be inscribed.

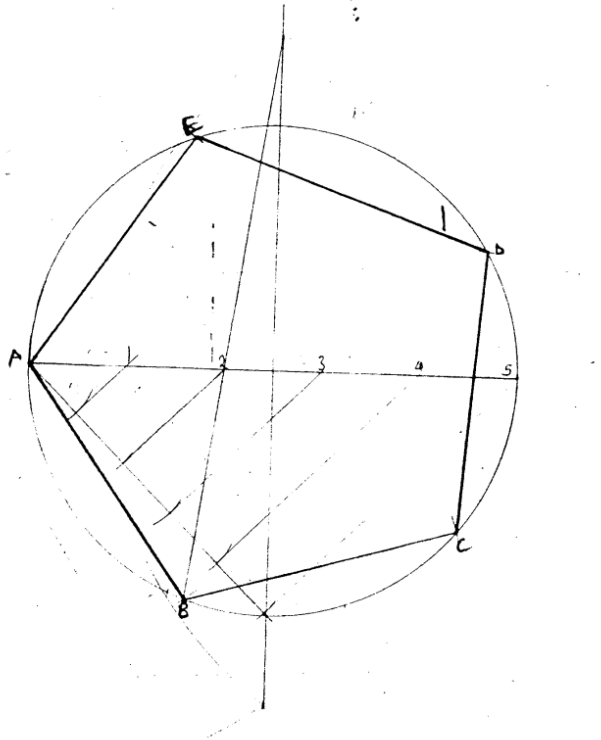
(ii) Draw a horizontal diameter through the center of the circle.
This diameter serves as a reference line for locating the first two vertices of the hexagon.

(iii) Using the radius of the circle, step off six equal arcs along the circumference.
Each step marks a vertex of the regular hexagon because the side of a regular hexagon is equal to the radius of its circumcircle.

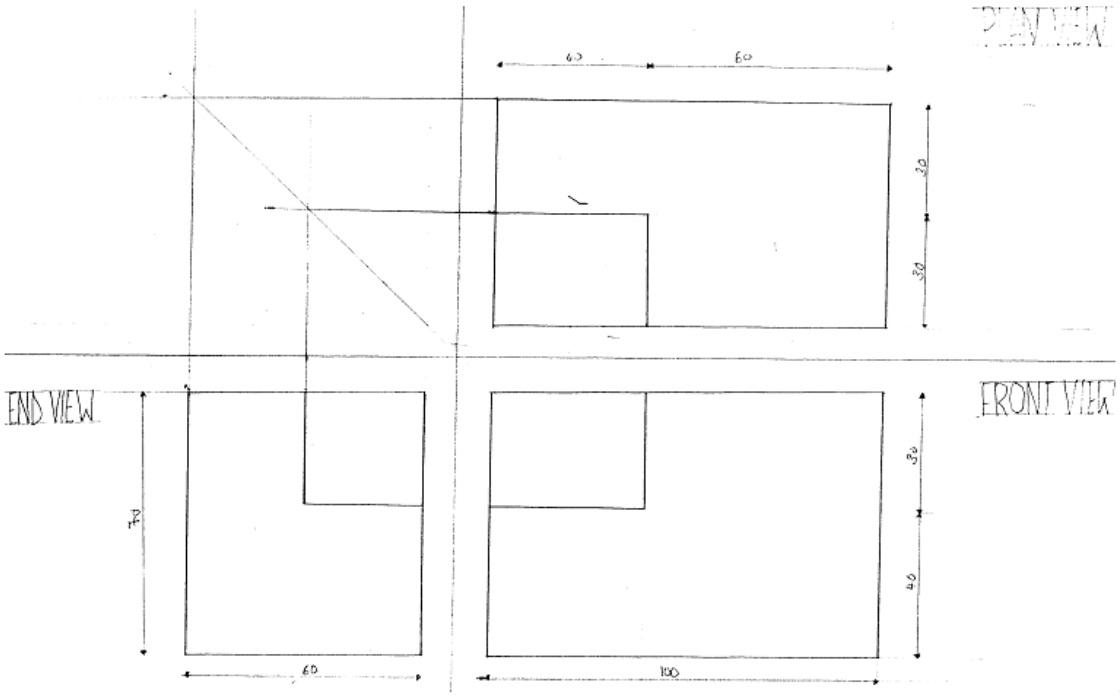
(iv) Join the six points consecutively with straight lines.
This completes the construction of a regular hexagon inscribed in the circle.

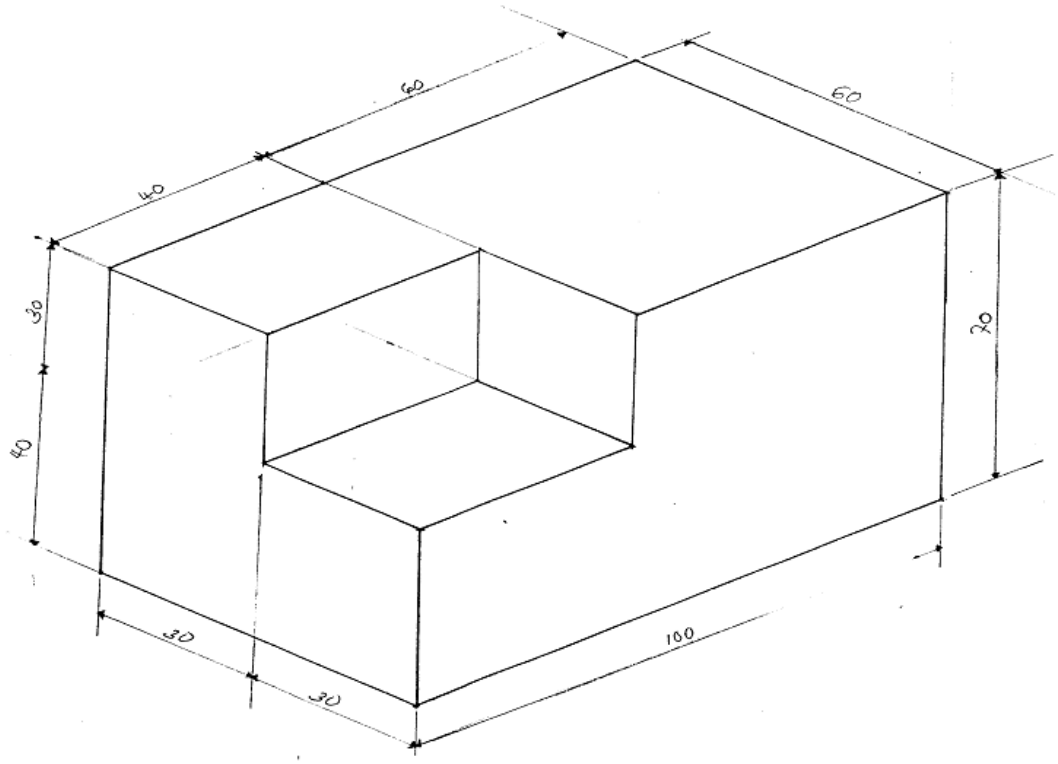
(b) Using scale of 1:1, draw the pentagon when the diameter of circle equals to 88mm.

A circle of diameter 88mm is first drawn. The circle is divided into five equal parts using appropriate geometric construction. The five division points on the circumference are then joined consecutively with straight lines to form a regular pentagon at full scale.



6. The figure below is a plan and front elevation of a certain wooden object in the drawing office. In order to give a carpenter for making it, two views are required to be added. Using a scale of 1:1, draw: (a) The missing end elevation. (b) The object in isometric projection.





7. The figure is the sketch of the U-shape of wooden block which is to be prepared as a teaching material to the kindergarten school. In order to make it, the orthographic views were supposed to be prepared. Using a scale of 1:1, draw: